Volunteer Lake Assessment Program Individual Lake Reports

ONWAY LAKE, RAYMOND, NH

MORPHOMETRIC DATA

Watershed Area (Ac.):	5,867	**Max. Depth (m):**	8.9	**Flushing Rate (yr^{-1}):**	5.3
Surface Area (Ac.):	192	**Mean Depth (m):**	3	**P Retention Coef:**	0.5
Shore Length (m):	3,900	**Volume (m^3):**	2,160,000	**Elevation (ft):**	265

TROPHIC CLASSIFICATION

Year	Trophic class
1989	MESOTROPHIC
2004	MESOTROPHIC

KNOWN EXOTIC SPECIES

The Waterbody Report Card tables are generated from the 2012 305(b) report on the status of N.H. waters, and are based on data collected from 2001-2011.

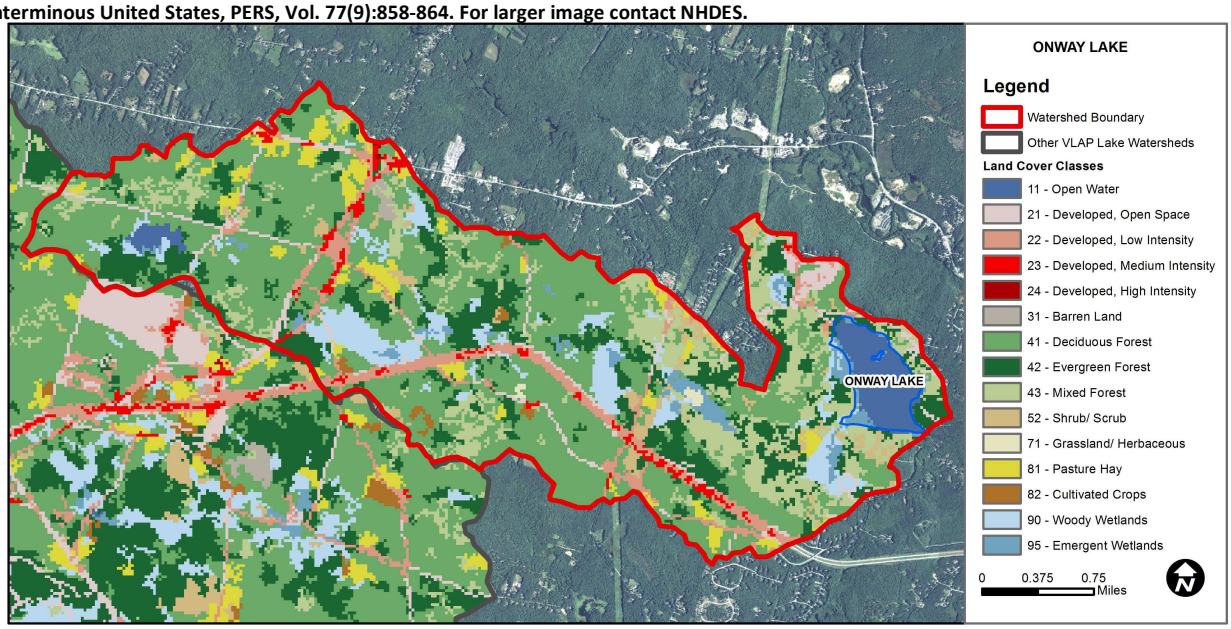
Designated Use	Parameter	Category	Comments
Aquatic Life	Phosphorus (Total)	Slightly Bad	>/=5 samples and median is >threshold.
	pH	Slightly Bad	>10% of samples exceed criteria by a small margin (minimum of 2 exceedances).
	D.O. (mg/L)	Encouraging	< 10 samples and no exceedance of criteria. More data needed.
	D.O. (% sat)	Slightly Bad	>10% of samples exceed criteria by a small margin (minimum of 2 exceedances).
	Chlorophyll-a	Slightly Bad	>5 samples and median is > threshold.
Primary Contact Recreation	E. coli	Very Good	All bacteria samples <75% of geometric mean criteria, but not enough to calculate geometric mean. Or, all bacteria samples are < single sample criteria and calculated Geometric means are less than geometric mean criteria.
	Chlorophyll-a	Very Good	At least 10 samples with 0 exceedances of criteria.

BEACH PRIMARY CONTACT ASSESSMENT STATUS

ONWAY LAKE - CAMP ONWAY BEACH	E. coli	Very Good	All bacteria samples <75% of geometric mean criteria, but not enough to calculate geometric mean. Or, all bacteria samples are < single sample criteria and calculated Geometric means are less than geometric mean criteria.
ONWAY LAKE - RAYMOND TOWN BEACH	E. coli	No Data	No Data for this parameter.

WATERSHED LAND USE SUMMARY

Fry, J., Xian, G., Jin, S., Dewitz, J., Homer, C., Yang, L., Barnes, C., Herold, N., and Wickham, J., 2011. Completion of the 2006 National Land Cover Database for the Conterminous United States, PERS, Vol. 77(9):858-864. For larger image contact NHDES.

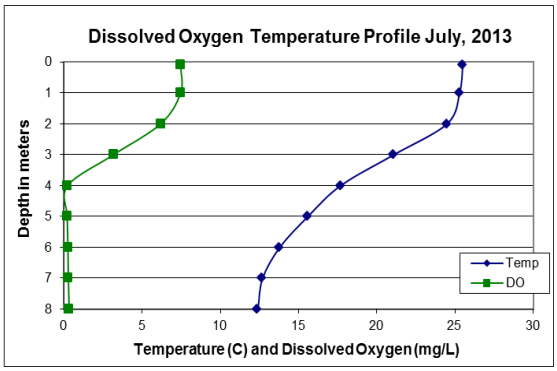


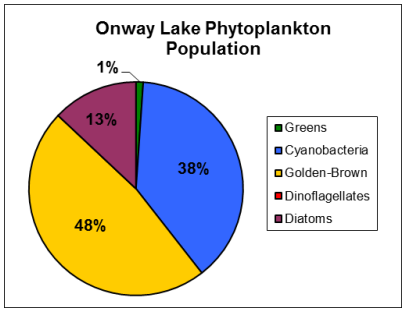
Land Cover Category	% Cover	Land Cover Category	% Cover	Land Cover Category	% Cover
Open Water	3.54	Barren Land	0.27	Grassland/Herbaceous	0.2
Developed-Open Space	3.57	Deciduous Forest	42.19	Pasture Hay	4.05
Developed-Low Intensity	5.09	Evergreen Forest	14.73	Cultivated Crops	0.45
Developed-Medium Intensity	1.41	Mixed Forest	13.37	Woody Wetlands	6.26
Developed-High Intensity	0.04	Shrub-Scrub	2.51	Emergent Wetlands	2.28

VOLUNTEER LAKE ASSESSMENT PROGRAM INDIVIDUAL LAKE REPORTS
ONWAY LAKE, RAYMOND, NH
2013 DATA SUMMARY

OBSERVATIONS AND RECOMMENDATIONS (*Refer to Table 1 and Historical Deep Spot Data Graphics)*

- **CHLOROPHYLL-A:** Chlorophyll levels were slightly elevated in July and increased greatly from 2012. Stormwater runoff from above average early summer rainfall may have contributed nutrients necessary to promote algal growth Historical trend analysis indicates relatively stable chlorophyll with moderate variability between years.
- **CONDUCTIVITY/CHLORIDE:** Deep spot and tributary conductivity and chloride were elevated, particularly in No Name Inlet, and much greater than the state medians. Historical trend analysis indicates highly variable epilimnetic conductivity between years.
- **E. COLI:** Tributary and near shore E. coli levels were low and much less than state standards for surface waters.
- **TOTAL PHOSPHORUS:** Epilimnetic phosphorus increased slightly from 2012 but was average for most NH lakes. Historical trend analysis indicates relatively stable epilimnetic phosphorus with moderate variability between years. Metalimnetic phosphorus was elevated and the turbidity was also elevated indicating a layer of algae. Hypolimnetic phosphorus was also elevated and dissolved oxygen levels were below 1.0 mg/L which may result in phosphorus and other organic compounds being released from bottom sediments. Tributary and near shore phosphorus levels were average.
- **TRANSPARENCY:** Transparency was lower than measured in 2012 and slightly less than the state median. Viewscope transparency was much better than that measured without. Historical trend analysis indicates highly variable transparency between years.
- **TURBIDITY:** Tributary, near shore, and epilimnetic turbidities were low. Metalimnetic turbidity was slightly elevated likely due to a layer of algae. Hypolimnetic turbidity was slightly elevated likely due to the release of organic compounds during anoxic conditions.
- **PH:** Deep spot pH levels were less than desirable range 6.5 – 8.0 units in the Metalimnion and Hypolimnion. Historical trend analysis indicates relatively stable epilimnetic pH with moderate variability between years.
- **RECOMMENDED ACTIONS:** Conductivity and chloride levels were elevated indicating winter road maintenance practices are impacting the lake. Encourage local road agents and plow operators to obtain a Voluntary NH Salt Applicator license through the UNH Technology Transfer Center's (T2) Green SnowProw Certification Program. Increase monitoring frequency to three times per summer to better assess summer water quality and decrease annual variability.





NH Water Quality Standards: Numeric criteria for specific parameters. Results exceeding criteria are considered a water quality violation.
Chloride: < 230 mg/L (chronic)
E. coli: > 88 cts/100 mL – public beach
E. coli: > 406 cts/100 mL – surface waters
Turbidity: > 10 NTU above natural level
pH: 6.5-8.0 (unless naturally occurring)

NH Median Values: Median values for specific parameters generated from historic lake monitoring data.
Alkalinity: 4.9 mg/L
Chlorophyll-a: 4.58 mg/m^3
Conductivity: 40.0 uS/cm
Chloride: 4 mg/L
Total Phosphorus: 12 ug/L
Transparency: 3.2 m
pH: 6.6

Table 1. 2013 Average Water Quality Data for ONWAY LAKE

Station Name	Alk. mg/l	Chlor-a ug/l	Chloride mg/l	Cond. uS/cm	E. Coli #/100ml	Total P ug/l	Trans. m NVS	Trans. m VS	Turb. ntu	pH
Dam Outlet				155.4	10	12			0.86	6.66
Epilimnion	8.90	6.16	39	156.8		11	2.76	3.46	0.75	6.55
Metalimnion				159.3		20			2.07	5.98
Hypolimnion				170.0		29			1.84	6.42
Inlet			44	186.0	110	23			1.77	6.22
Island Road				156.3	10	11			0.80	6.64
No Name Inlet			65	269.0	10	16			0.56	6.66
Sandy Cove				158.6	10	13			0.86	6.61
Seannikki				137.5	20	11			0.74	6.65

HISTORICAL WATER QUALITY TREND ANALYSIS

Parameter	Trend	Explanation	Parameter	Trend	Explanation
pH	Stable	Trend not significant; data moderately variable.	Chlorophyll-a	Stable	Trend not significant; data moderately variable.
Conductivity	Stable	Trend not significant; data highly variable.	Transparency	Stable	Trend not significant; data highly variable.
			Phosphorus (epilimnion)	Stable	Trend not significant; data moderately variable.